

Amendments to the Claims:

Please amend the claims as follows:

1. (Previously Presented) A catalytic combustor comprising:

a first catalytic stage comprising a metallic catalyst support and receiving an oxidizer and a fuel and discharging a partially oxidized fuel/oxidizer mixture;

a second catalytic stage comprising a ceramic reticulated foam catalyst support disposed within a pressure boundary defining a pressure boundary cross-sectional flow area, the foam catalyst support receiving a first portion of the mixture and presenting a support cross-sectional flow area less than the pressure boundary cross-sectional flow area to define a bypass passageway for allowing a second portion of the mixture to bypass the foam catalytic support, the second catalytic stage having an outlet temperature elevated sufficiently to completely oxidize the mixture without using a separate ignition source;

an oxidation completion stage disposed downstream of the second catalytic stage for recombining the first and second portions of the mixture and completing oxidation of the mixture, and

a transition stage disposed between the first catalytic stage and the second catalytic stage, the transition stage comprising a narrowed flow area region disposed between an inlet end receiving the partially oxidized fuel/oxidizer mixture from the first catalytic stage and an outlet end discharging the partially oxidized fuel/oxidizer mixture into the second catalytic stage, wherein the narrowed flow area region of the transition stage has a narrower flow area than each of the first catalytic stage and the second catalytic stage.

2. (Original) The catalytic combustor of claim 1, wherein the second catalytic stage further comprises a catalytic material selected from the group consisting of perovskite, zeolite, and hexaaluminate.

3. (Original) The catalytic combustor of claim 1, wherein the bypass passageway is disposed around a portion of a perimeter of the ceramic reticulated foam catalytic support.

4. (Original) The catalytic combustor of claim 1, wherein the ceramic reticulated foam catalytic support comprises a cruciform cross-section.

5. (Original) The catalytic combustor of claim 1, wherein the ceramic reticulated foam support comprises a donut-shaped cross-section.

6-23. (Canceled)

24. (Currently amended) A catalytic combustor comprising:

an upstream pressure boundary comprising a catalytic surface disposed therein for receiving a fuel/oxidizer mixture and discharging a partially oxidized fuel/oxidizer mixture;

a downstream pressure boundary defining a pressure boundary cross-sectional flow area for receiving the partially oxidized fuel/oxidizer mixture; and

a catalyst-coated reticulated foam support disposed within the downstream pressure boundary for receiving a first portion of the mixture and presenting a support cross-sectional flow area less than the downstream pressure boundary cross-sectional flow area to define a bypass passageway for allowing a second portion of the fuel/oxidizer mixture to bypass the foam support; and

a plurality of additional bypass passageways for allowing the second portion of the fuel/oxidizer mixture to bypass the foam support, wherein said plurality of additional bypass passageways comprises a plurality of spaced apart, tubular passageways extending longitudinally through the foam support;

wherein the bypass passageway is disposed around a portion of an outer perimeter of the reticulated foam support; and

wherein the reticulated foam support comprises a cross-section perimeter smaller than an internal perimeter of the pressure boundary, the foam support supported against the internal perimeter by spaced apart standoffs comprising the reticulated foam support.

25. (Original) The catalytic combustor of claim 24, wherein the reticulated foam support comprises a cross-section sized to bypass from 25% to 80% of the mixture past the foam support.

26. (Original) The catalytic combustor of claim 24, wherein the reticulated foam support defines a plurality of separate passageways within the pressure boundary.

27. (Canceled)

28. (Original) The catalytic combustor of claim 24 wherein the reticulated foam support comprises a cruciform cross-section.

29. (Original) The catalytic combustor of claim 24 wherein the reticulated foam support comprises a donut-shaped cross-section.

30. (Canceled)

31. (Original) The catalytic combustor of claim 24 wherein the reticulated foam support comprises a ceramic material.

32. (Previously Presented) The catalytic combustor of claim 1, wherein the narrowed flow region is configured for generating a venturi effective to protect the first catalytic stage from heat generated in the second catalytic stage.

33. (Canceled)

34. (Previously Presented) The catalytic combustor of claim 1, wherein the transition stage is configured to substantially limit combustion of the partially oxidized fuel/oxidizer mixture from the first catalytic stage.

35. (Canceled)

36. (Previously presented) The catalytic combustor of claim 24, further comprising a transition pressure boundary disposed between the upstream pressure boundary and the downstream pressure boundary, the transition pressure boundary comprising a narrowed flow area region effective to generate a venturi effect disposed between an inlet end receiving the oxidized fuel/oxidizer mixture from the upstream pressure boundary and an outlet end discharging the partially oxidized fuel/oxidizer mixture into the downstream pressure boundary, wherein the transition pressure

boundary is configured to substantially limit combustion of the partially oxidized fuel/oxidizer mixture from the upstream pressure boundary.

37. (Canceled)